

THE EUPHAUSIACEAN CRUSTACEANS OF THE "ALBA-
TROSS" EXPEDITION TO THE PHILIPPINES.

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INTRODUCTION.

At the request of the Commissioner of Fisheries, I promised to work up the Schizopod Crustaceans and Sergestidae gathered by the United States Fisheries steamer *Albatross* during the Philippine expedition of 1907-1910, and the present paper, which is the first instalment, deals with the order Euphausiacea. Before entering on the description of the genera and species it may be appropriate to give a brief introduction.

The Schizopoda and the Sergestidae are all free-swimming throughout life and may occur near the bottom, but are most often truly pelagic, living near the surface or in deeper layers of the ocean. Many species, especially of the order Mysidacea, inhabit shallow water not far from the coast; while most of the Euphausiacea and many Sergestidae are truly oceanic. Consequently only a small number of the specimens, and especially of larger forms, were taken in the trawl or the dredge, the large majority having been secured in nets with other Plankton. Only a small portion of the animals had been sorted, but I received a large number of bottles containing Plankton samples. From the great majority of these samples all Schizopoda and Sergestidae were removed under my supervision, but as several of the large bottles contained an immense number of these Crustacea, about one-third of the contents was taken out and the Schizopoda, etc., separated.

As the material of the Crustacea mentioned is very large, I found it necessary to divide it into three portions according to orders. Although the material of the Euphausiacea is larger than that of the two other groups, it was selected because I was sure that nearly all species were known beforehand, as most of the forms of this order have a very wide geographical distribution, and I had worked out the Schizopoda from the Dutch *Siboga* expedition, which had explored an adjacent area, namely, the seas and straits in the Indian Archipelago.

The list on the following pages shows that the collection is a very large one, being preserved in more than 200 vials and bottles, and comprising 29 species. Two of these species are new to science, but it may be pointed out that they are closely allied to well-known species; and here a comparison with the *Siboga* collection may be of interest.¹ The *Siboga* collected 25 species of Euphausiacea, and only three of these (*Bentheuphausia amblyops* G. O. Sars, *Euphausia paragibba* H. J. Hansen, and *Stylocheiron insulare* H. J. Hansen) are not represented in the Philippine material. Consequently this latter collection contains seven species not obtained by the *Siboga*; two of these species are new to science, but the five remaining species (*Thysanopoda pectinata* Ortmann, *T. cornuta* Illig, *Euphausia recurva* H. J. Hansen, *E. brevis* H. J. Hansen, and *Nematobrachion flexipes* Ortmann) are all known from the eastern tropical Pacific as well as from the Atlantic. It may be added that all the species from the Philippines excepting five, namely, three species of *Euphausia* (*E. similis* G. O. Sars, *E. hemigibba* H. J. Hansen, and *E. sibogæ* H. J. Hansen), and the two species established in the present paper, are known from the eastern tropical Pacific or the Fiji Islands and have been dealt with in my work on the Agassiz Schizopoda.² As all the Philippine forms—excepting the two new species—have been mentioned or described and figured either in the *Siboga* work or in the paper just mentioned, I have considered it unnecessary to give references to the literature or to deal with geographical distribution. Moreover, in a paper on the Euphausiacea of the United States National Museum recently published,³ almost all the species enumerated in the following pages have been mentioned, as that Museum possessed them from other areas.

In hauls from 100 to 350 fathoms or more, frequently several species were present, while hauls from near the surface generally contained only a few forms or even a single species, but not infrequently an enormous number of specimens of one or two species. Four species, namely, *Thysanopoda tricuspidata* Milne Edwards, *Euphausia pseudogibba* Ortmann, and especially *Euphausia diomedæae* Ortmann, and *Pseudeuphausia latifrons* G. O. Sars, have not only been taken at a number of places, but sometimes in such large numbers that one may safely conclude that these animals have considerable value as food for fishes. But it need scarcely be said that an investigation of a large number of stomachs of various food-fishes must be undertaken before it will be possible to pronounce a well-founded judgment on the relative significance of the species of Euphausiacea as food material.

¹ See my report in *Siboga-Expeditie*, monograph 37, 1910.

² Mem. Mus. Comp. Zool., vol. 35, No. 4, 1912.

³ Proc. U. S. Nat. Mus., vol. 48, 1915, pp. 59-114.

In the following lists I have arranged the stations according to latitude north, beginning with the most northern locality. The area explored is narrow-oblong, as the distance between the northern and southern boundaries is about three times as great as that between the western and eastern.

DESCRIPTIONS OF SPECIMENS.

THYSANOPODA Milne Edwards.

The collection contains 6 of the 11 species hitherto known.

1. THYSANOPODA TRICUSPIDATA Milne Edwards.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31' N.$; long. $117^{\circ} 53' E.$ 20 fathoms. 7.23 p. m. Surf. temp. 79° . 6 specimens, small or half-grown.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 1 larva.

D. 5436. May 7, 1909. Off Corregidor Light, west coast of Luzon. Lat. $14^{\circ} 22' 37'' N.$; long. $120^{\circ} 29' E.$ Surface. 7.03 p. m. Surf. temp. 86° . 1 specimen (sublarval).

D. 5120. January 21, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 45' 30'' N.$; long. $120^{\circ} 30' 15'' E.$ 350 fathoms. 3.10 p. m. Bot. temp. 43.7° , dens. 1.02480. 2 specimens, half-grown.

D. 5288. July 22, 1908. Off Matocot Point, Luzon. Lat. $13^{\circ} 43' 30'' N.$; long. $121^{\circ} E.$ 115 fathoms. 8.14 a. m. 1 specimen (sublarval).

D. 5457. June 8, 1909. Off Legaspi Point, east coast of Luzon. Lat. $13^{\circ} 12' N.$; long. $123^{\circ} 49' 40'' E.$ 146 fathoms. 9.40 a. m. 3 specimens.

D. 5422. March 30, 1909. Off Lusan Point. Lat. $10^{\circ} 31' N.$; long. $122^{\circ} 18' 45'' E.$ Surface. 7.17 p. m. Surf. temp. 82° . 2 specimens (sublarval).

D. 5539. August 19, 1909. Off Apo Island. Lat. $9^{\circ} 03' 20'' N.$; long. $123^{\circ} 24' 45'' E.$ Surface. 7.11 p. m. Surf. temp. 83° . 1 small specimen.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45'' N.$; long. $124^{\circ} 36' 45'' E.$ 200 fathoms. 1.25 a. m. Surf. temp. 84° , bot. 53.5° . 9 specimens.

D. 5544. September 6, 1909. Off Coronado Point, northern Mindanao. Lat. $8^{\circ} 16' 30'' N.$; long. $122^{\circ} 26' 30'' E.$ 600 fathoms. 11.17 a. m. Bot. temp. 49.8° . 1 specimen.

D. 5553. September 17, 1909. Sulade Island, anchorage. Lat. $5^{\circ} 51' N.$; long. $120^{\circ} 46' 30'' E.$ Surface. 7.28 p. m. Surf. temp. 83° . 1 specimen, very small.

D. 5649. December 16, 1909. Off North Island, Buton Strait. Lat. $5^{\circ} 36' N.$; long. $122^{\circ} 07' 36'' E.$ Surface. 7.23 p. m. Surf. temp. 83° . 4 specimens, half-grown.

D. 5600. November 7, 1909. North of Celebes. Lat. $2^{\circ} 05' N.$; long. $123^{\circ} 52' 30'' E.$ Surface. 7.06 p. m. Surf. temp. 82° . Large number of specimens.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36' N.$; long. $126^{\circ} 52' 20'' E.$ 20-30 fathoms. 6.44 p. m. Surf. temp. 84° . Large number of specimens.

D. 5627. November 30, 1909. Off Kayoa Island, Molucca Passage. Lat. $0^{\circ} 06' N.$; long. $127^{\circ} 26' E.$ 5 fathoms. 6.02 p. m. Surf. temp. 83° . 2 specimens, not adult.

D. 5672. December 30, 1909. Off Dongala Light, Macassar Strait. Lat. $0^{\circ} 29' S.$; long. $118^{\circ} 51' E.$ Surface. 7.26 p. m. Surf. temp. 83° . About 20 specimens, half-grown.

D. 5611. November 19, 1909. Off Buka Buka Island, Gulf of Tomini, Celebes. Lat. $0^{\circ} 40' 30'' S.$; long. $121^{\circ} 50' E.$ Surface. 7.14 p. m. Surf. temp. 84° . 10 specimens (1 adult, 9 very small).

D. 5633. December 2, 1909. Off Selang Point. Lat. $1^{\circ} 03' S.$; long. $127^{\circ} 44' E.$ Surface. 7.14 p. m. Surf. temp. 84° . Enormous number of specimens.

D. 5669. December 29, 1909. Off Mamuju Island, Macassar Strait. Lat. $2^{\circ} 19' 30'' S.$; long. $118^{\circ} 50' E.$ Surface. 7.25 p. m. Surf. temp. 84° . Numerous specimens.

Without label. Immense number of specimens.

Remarks.—One of the largest females, in the bottle without label, measures 26 mm. in length.

2. THYSANOPODA MONOCANTHA Ortmann.

D. 5288. July 22, 1908. Off Matocot Point, Luzon. Lat. $13^{\circ} 43' 30'' N.$; long. $121^{\circ} E.$ 115 fathoms. 8.14 a. m. 1 specimen.

D. 5287. July 20, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40'' N.$; long. $120^{\circ} 39' E.$ 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 2 specimens.

D. 5422. March 30, 1909. Off Lusaran Point. Lat. $10^{\circ} 31' N.$; long. $122^{\circ} 18' 45'' E.$ Surface. 7.17 p. m. Surf. temp. 82° . 3 larvæ.

D. 5497. August 3, 1909. Off Bantigui Island. Lat. $9^{\circ} 07' 15'' N.$; long. $124^{\circ} 59' 30'' E.$ 800 fathoms. 10.59 a. m. Bot. temp. 52.3° . 1 specimen.

D. 5129. February 5, 1908. Off western Mindanao. Lat. $7^{\circ} 41' 30'' N.$; long. $122^{\circ} 01' 45'' E.$ 100 fathoms. 2.23 p. m. Bot. temp. 57.6° . 1 specimen (older larva).

3. THYSANOPODA ÆQUALIS H. J. Hansen,

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 1 specimen, half-grown.

D. 5457. June 8, 1909. Off Legaspi Point, east coast of Luzon. Lat. $13^{\circ} 12' N.$; long. $123^{\circ} 49' 40'' E.$ 146 fathoms. 9.40 a. m. 3 small specimens.

D. 5422. March 30, 1909. Off Lusan Point. Lat. $10^{\circ} 31' N.$; long. $122^{\circ} 18' 45'' E.$ Surface. 7.17 p. m. Surf. temp. 82° . 7 specimens, half-grown.

4. THYSANOPODA PECTINATA Ortmann.

D. 5287. July 20, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40'' N.$; long. $120^{\circ} 39' E.$ 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 1 specimen (adult male.)

5. THYSANOPODA ORIENTALIS H. J. Hansen.

D. 5120. January 21, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 45' 30'' N.$; long. $120^{\circ} 30' 15'' E.$ 350 fathoms. 3.10 p. m. Bot. temp. 43.7° , dens. 1.02480. 3 specimens.

D. 5287. July 20, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40'' N.$; long. $120^{\circ} 39' E.$ 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 8 specimens.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22'' N.$; long. $124^{\circ} 45' 06'' E.$ 100 fathoms. 9.00 p. m. $\frac{1}{2}$ specimen.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45'' N.$; long. $124^{\circ} 36' 45'' E.$ 200 fathoms. 11.25 a. m. Bot. temp. 53.5° . 5 specimens.

D. 5544. September 6, 1909. Off Coronado Point, northern Mindanao. Lat. $8^{\circ} 16' 30'' N.$; long. $122^{\circ} 26' 30'' E.$ 600 fathoms. 11.17 a. m. Bot. temp. 49.8° . 1 specimen.

6. THYSANOPODA CORNUTA Illig.

D. 5471. June, 1909. Off Sialat Point Light, east coast of Luzon. Lat. $13^{\circ} 34' 57'' N.$; long. $123^{\circ} 47' 06'' E.$ 568 fathoms. 9.17 a. m. 2 specimens.

Remarks.—One of the specimens, an adult female, is very large, measuring 81.5 mm. from the front margin of the carapace to the end of telson.

Genus EUPHAUSIA Dana.

Of this very large genus the collection contains 10 species, one of which is new.

7. EUPHAUSIA DIOMEDEÆ Ortmann.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31' N.$; long. $117^{\circ} 53' E.$ 20 fathoms. 7.23 p. m. Surf. temp. 79° . 18 specimens.

November 11, 1908. Port San Pio Quinto, China Sea. (About lat. 21° N.; long. 122° E.) 5 feet. 9 a. m. 1 specimen.

D. 5436. May 7, 1909. Off Corregidor Light, west coast of Luzon. Lat. $14^{\circ} 22' 37''$ N.; long. $120^{\circ} 29'$ E. Surface. 7.03 p. m. Surf. temp. 86° . 1 specimen.

D. 5120. January 21, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 45' 30''$ N.; long. $120^{\circ} 30' 15''$ E. 350 fathoms. 3.10 p. m. Bot. temp. 43.7° , dens. 1.02480. 1 specimen.

D. 5288. July 22, 1908. Off Matacot Point, Luzon. Lat. $13^{\circ} 43' 30''$ N.; long. 121° E. 115 fathoms. 8.14 a. m. Numerous specimens.

D. 5287. July 20, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40''$ N.; long. $120^{\circ} 39'$ E. 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 17 specimens.

D. 5176. March 24, 1908. Off Escarceo Light, Verde Island Passage. Lat. $13^{\circ} 35' 15''$ N.; long. $120^{\circ} 53' 20''$ E. Surface. 7.01 p. m. Surf. temp. 79° . About 25 specimens.

D. 5456. June 7, 1909. Off Legaspi Light, east coast of Luzon. Lat. $13^{\circ} 11' 10''$ N.; long. $123^{\circ} 51' 52''$ E. 120 fathoms. 12.55 p. m. Immense number of half-grown specimens.

D. 5195. April 3, 1908. Off Capitancillo Island, off northern Cebu Island. Lat. $10^{\circ} 47'$ N.; long. $124^{\circ} 06' 30''$ E. Surface. 7.03 p. m. Surf. temp. 84° , dens. 1.02514. About 40 specimens.

D. 5422. March 30, 1909. Off Lusaran Point. Lat. $10^{\circ} 31'$ N.; long. $122^{\circ} 18' 45''$ E. Surface. 7.17 p. m. Surf. temp. 82° . About 130 specimens.

D. 5258. June 2, 1908. Off southern Panay. Lat. $10^{\circ} 27' 45''$ N.; long. $122^{\circ} 12' 30''$ E. Surface. 7.08 p. m. Surf. temp. 84° , dens. 1.02587. 1 specimen.

D. 5190. April 1, 1908. Off Pescador Island. Lat. $10^{\circ} 08' 15''$ N.; long. $123^{\circ} 16' 45''$ E. 250 fathoms. 4.39 p. m. Bot. temp. 63° , dens. 1.02482. 3 specimens.

D. 5232. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 45''$ N.; long. $124^{\circ} 44' 06''$ E. Surface. 8.25 p. m. Surf. temp. 84° , dens. 1.02531. 8 specimens.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22''$ N.; long. $124^{\circ} 45' 06''$ E. 100 fathoms. 9.00 p. m. Immense number of specimens.

D. 5234. May 7, 1908. Off Limasaua Island. Lat. 10° N.; long. $124^{\circ} 46' 06''$ E. 15 fathoms. 9.42 p. m. Surf. temp. 84° , dens. 1.02531. 7 specimens.

D. 5531. August 11, 1909. Off Balicasag Island. Lat. $9^{\circ} 27' 30''$ N.; long. $123^{\circ} 38'$ E. Surface. 7.49 p. m. Surf. temp. 84° . Immense number of specimens.

D. 5530. August 11, 1909. Off Balicasag Island. Lat. $9^{\circ} 26' 45''$ N.; long. $123^{\circ} 38' 30''$ E. Surface. 7.14 p. m. Surf. temp. 84° . Immense number of specimens.

D. 5495. August 2, 1909. Off Diuata Point, between Leyte and Mindanao. Lat. $9^{\circ} 06' 30''$ N.; long. $125^{\circ} 00' 20''$ E. 600 fathoms. 1.54 p. m. Bot. temp. 52.3° . About 30 specimens.

D. 5539. August 19, 1909. Off Apo Island. Lat. $9^{\circ} 03' 20''$ N.; long. $123^{\circ} 24' 45''$ E. Surface. 7.11 p. m. Surf. temp. 83° . 20 specimens.

D. 5540. August 19, 1909. Off Apo Island. Lat. $9^{\circ} 03' 00''$ N.; long. $123^{\circ} 24' 30''$ E. Surface. 7.42 p. m. Surf. temp. 83° . 30 specimens.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45''$ N.; long. $124^{\circ} 36' 45''$ E. 200 fathoms. 11.25 a. m. Surf. temp. 84° , bot. 53.5° . Immense number of specimens, mostly half-grown.

August 4, 1909. Opol, Macajalar Bay, Mindanao. (About lat. $8^{\circ} 37\frac{3}{4}'$ N.) 5–12 feet. 1 p. m. 1 specimen.

D. 5544. September 6, 1909. Off Coronado Point, northern Mindanao. Lat. $8^{\circ} 16' 30''$ N.; long. $122^{\circ} 26' 30''$ E. 600 fathoms. 11.17 a. m. Bot. temp. 49.8° . 6 specimens.

D. 5600. November 7, 1909. North of Celebes. Lat. $2^{\circ} 05' 00''$ N.; long. $123^{\circ} 52' 30''$ E. Surface. 7.06 p. m. Surf. temp. 82° . About 30 specimens.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36' 00''$ N.; long. $126^{\circ} 52' 20''$ E. 20–30 fathoms. 6.44 p. m. Surf. temp. 84° . 8 specimens.

D. 5672. December 30, 1909. Off Dongala Light, Macassar Strait. Lat. $0^{\circ} 29' 00''$ S.; long. $118^{\circ} 51' 00''$ E. Surface. 7.26 p. m. Surf. temp. 83° . Immense number of specimens.

D. 5611. November 19, 1909. Off Buka Buka Island, Gulf of Tomini, Celebes. Lat. $0^{\circ} 40' 30''$ S.; long. $121^{\circ} 50' 00''$ E. Surface. 7.14 p. m. Surf. temp. 84° . Numerous specimens.

D. 5633. December 2, 1909. Off Selang Point. Lat. $1^{\circ} 03' 00''$ S.; long. $127^{\circ} 44' 00''$ E. Surface. 7.14 p. m. Surf. temp. 84° . Enormous number of specimens.

D. 5669. December 29, 1909. Off Mamuju Island, Macassar Strait. Lat. $2^{\circ} 19' 30''$ S.; long. $118^{\circ} 50' 00''$ E. Surface. 7.25 p. m. Surf. temp. 84° . Numerous specimens.

D. 5649. December 16, 1909. Off North Island, Buton Strait. Lat. $5^{\circ} 36' 00''$ S.; long. $122^{\circ} 07' 36''$ E. Surface. 7.23 p. m. Surf. temp. 83° . Numerous specimens.

Remarks.—The long list of localities shows that this species is not only commonly distributed in the area explored, but that it is extremely abundant at the surface at certain stations.

8. *EUPHAUSIA MUTICA* H. J. Hansen.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31' N.$; long. $117^{\circ} 53' E.$ 20 fathoms. 7.23 p. m. Surf. temp. 79° . 11 specimens.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 6 specimens.

D. 5581. September 25, 1909. Off Bumbum Island, near Darvel Bay, Borneo. Lat. $4^{\circ} 30' 25'' N.$; long. $118^{\circ} 41' 30'' E.$ Ship at anchor. Surface. 5.55 p. m. Surf. temp. 83° . 1 specimen.

D. 5600. November 7, 1909. North of Celebes. Lat. $2^{\circ} 05' N.$; long. $123^{\circ} 52' 30'' E.$ Surface. 7.06 p. m. Surf. temp. 82° . About 30 specimens.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36' N.$; long. $126^{\circ} 52' 20'' E.$ 20-30 fathoms. 6.44 p. m. Surf. temp. 84° . About 30 specimens.

D. 5672. December 30, 1909. Off Dongala Light, Macassar Strait. Lat. $0^{\circ} 29' S.$; long. $118^{\circ} 51' E.$ Surface. 7.26 p. m. Surf. temp. 83° . 19 specimens.

D. 5649. December 16, 1909. Off North Island, Buton Strait. Lat. $5^{\circ} 36' S.$; long. $122^{\circ} 07' 36'' E.$ Surface. 7.23 p. m. Surf. temp. 83° . 17 specimens.

9. *EUPHAUSIA RECURVA* H. J. Hansen.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31' N.$; long. $117^{\circ} 53' E.$ 20 fathoms. 7.23 p. m. Surf. temp. 79° . About 25 specimens.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. About 30 specimens.

10. *EUPHAUSIA BREVIS* H. J. Hansen.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31' N.$; long. $117^{\circ} 53' E.$ 20 fathoms. 7.23 p. m. Surf. temp. 79° . 1 specimen.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36' N.$; long. $126^{\circ} 52' 20'' E.$ 20-30 fathoms. 6.44 p. m. Surf. temp. 84° . 1 specimen.

11. *EUPHAUSIA SIMILIS* G. O. Sars.

D. 5287. July 20, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40'' N.$; long. $120^{\circ} 39' E.$ 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 1 specimen.

Remarks.—The specimen captured is an adult male, which is quite normal, agreeing with the specimens captured by the *Challenger* and the Swedish Antarctic Expedition.

12. EUPHAUSIA TENERA H. J. Hansen.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31' N.$; long. $117^{\circ} 53' E.$ 20 fathoms. 7.23 p. m. Surf. temp. 79° . 14 specimens.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 14 specimens.

D. 5288. July 22, 1908, Off Matabac Point, Luzon. Lat. $13^{\circ} 43' 30'' N.$; long. $121^{\circ} E.$ 115 fathoms. 8.14 a. m. 1 specimen.

D. 5456. June 7, 1909. Off Legaspi Point, east coast of Luzon. Lat. $13^{\circ} 11' 10'' N.$; long. $123^{\circ} 51' 52'' E.$ 120 fathoms. 12.55 p. m. 1 specimen.

D. 5422. March 30, 1909. Off Lusaran Point. Lat. $10^{\circ} 31' N.$; long. $122^{\circ} 18' 45'' E.$ Surface. 7.17 p. m. Surf. temp. 82° . About 25 specimens.

D. 5553. September 17, 1909. Sulade Island, anchorage. Lat. $5^{\circ} 51' N.$; long. $120^{\circ} 46' 30'' E.$ Surface. 7.28 p. m. Surf. temp. 83° . 1 specimen.

D. 5600. November 7, 1909. North of Celebes. Lat. $2^{\circ} 05' N.$; long. $123^{\circ} 52' 30'' E.$ Surface. 7.06 p. m. Surf. temp. 82° . 6 specimens.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36' N.$; long. $126^{\circ} 52' 20'' E.$ 20-30 fathoms. 6.44 p. m. Surf. temp. 84° . About 25 specimens.

D. 5672. December 30, 1909. Off Dongala Point, Macassar Strait. Lat. $0^{\circ} 29' S.$; long. $118^{\circ} 51' E.$ Surface. 7.26 p. m. Surf. temp. 83° . 6 specimens.

D. 5611. November 19, 1909. Off Buka Buka Island, Gulf of Tomini, Celebes. Lat. $0^{\circ} 40' 30'' S.$; long. $121^{\circ} 50' E.$ Surface. 7.14 p. m. Surf. temp. 84° . About 30 specimens.

D. 5633. December 2, 1909. Off Selang Point. Lat. $1^{\circ} 03' S.$; long. $127^{\circ} 44' E.$ Surface. 7.14 p. m. Surf. temp. 84° . 4 specimens.

D. 5669. December 29, 1909. Off Manuju Island, Macassar Strait. Lat. $2^{\circ} 19' 30'' S.$; long. $118^{\circ} 50' E.$ Surface. 7.25 p. m. Surf. temp. 84° . About 30 specimens.

13. EUPHAUSIA PSEUDOGIBBA Ortmann.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 6 specimens.

D. 5120. January 21, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 45' 30'' N.$; long. $120^{\circ} 30' 15'' E.$ 350 fathoms. 3.10 p. m. Bot. temp. 43.7° , dens. 1.02480. 6 specimens.

D. 5288. July 22, 1908. Off Matabac Point, Luzon. Lat. $13^{\circ} 43' 30'' N.$; long. $121^{\circ} E.$ 115 fathoms. 8.14 a. m. About 125 specimens.

D. 5287. July 20, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40''$ N.; long. $120^{\circ} 39'$ E. 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 8 specimens.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22''$ N.; long. $124^{\circ} 45' 06''$ E. 100 fathoms. 9 p. m. About 20 specimens.

D. 5422. March 30, 1909. Off Lusaran Point. Lat. $10^{\circ} 31'$ N.; long. $122^{\circ} 18' 45''$ E. Surface. 7.17 p. m. Surf. temp. 82° . Large number of specimens.

D. 5531. August 11, 1909. Off Balicasag Island. Lat. $9^{\circ} 27' 30''$ N.; long. $123^{\circ} 38'$ E. Surface. 7.49 p. m. Surf. 84° . 2 specimens.

D. 5495. August 2, 1909. Off Diuata Point, between Leyte and Mindanao. Lat. $9^{\circ} 06' 30''$ N.; long. $125^{\circ} 00' 20''$ E. 600 fathoms. 1.54 p. m. Bot. temp. 52.3° . 1 specimen.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45''$ N.; long. $124^{\circ} 36' 45''$ E. 200 fathoms. 11.25 a. m. Surf. temp. 87° , bot. 53.5° . Large number of specimens.

D. 5581. September 25, 1909. Off Bumbum Island, near Darvel Bay, Borneo. Lat. $4^{\circ} 30' 25''$ N.; long. $118^{\circ} 41' 30''$ E. Ship at anchor. Surface. 5.55 p. m. Surf. temp. 83° . 1 specimen.

D. 5600. November 7, 1909. North of Celebes. Lat. $2^{\circ} 05'$ N.; long. $123^{\circ} 52' 30''$ E. Surface. 7.06 p. m. Surf. temp. 82° . 2 specimens.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36'$ N.; long. $126^{\circ} 52' 20''$ E. 20-30 fathoms. 6.44 p. m. Surf. temp. 84° . 3 specimens.

D. 5672. December 30, 1909. Off Dongola Light, Macassar Strait. Lat. $0^{\circ} 29'$ S.; long. $118^{\circ} 51'$ E. Surface. 7.26 p. m. Surf. temp. 83° . About 20 specimens.

D. 5633. December 2, 1909. Off Selang Point. Lat. $1^{\circ} 03'$ S.; long. $127^{\circ} 44'$ E. Surface. 7.14 p. m. Surf. temp. 84° . Large number of specimens.

D. 5669. December 29, 1909. Off Mamuju Island, Macassar Strait. Lat. $2^{\circ} 19' 30''$ S.; long. $118^{\circ} 50'$ E. Surface. 7.25 p. m. Surf. temp. 84° . 8 specimens.

D. 5649. December 16, 1909. Off North Island, Buton Strait. Lat. $5^{\circ} 36'$ S.; long. $122^{\circ} 07' 36''$ E. Surface. 7.23 p. m. Surf. temp. 83° . Immense number of specimens.

Remarks.—The list shows that *E. pseudogibba* has been taken not only in deeper layers of the sea but several times at the surface, and there sometimes in large numbers.

14. EUPHAUSIA HEMIGIBBA H. J. Hansen.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58'$ N.; long. $120^{\circ} 03'$ E. 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 5 specimens.

15. EUPHAUSIA SIBOGÆ H. J. Hansen.

D. 5288. July 22, 1908. Off Matacot Point, Luzon. Lat. $13^{\circ} 43' 30''$ N.; long. 121° E. 115 fathoms. 8.14 a. m. Numerous specimens.

D. 5553. September 17, 1909. Sulade Island, anchorage. Lat. $5^{\circ} 51' N.$; long. $120^{\circ} 46' 30'' E.$ Surface. 7.28 p. m. Surf. temp. 83° . 4 specimens.

16. EUPHAUSIA FALLAX, new species.

Plate 83, figs. 1a-1d.

D. 5288. July 22, 1908. Off Matacot Point, Luzon. Lat. $13^{\circ} 43' 30''$ N.; long. 121° E. 115 fathoms. 8.14 a. m. About 20 specimens.

Type-locality.—D. 5532. August 13, 1909. Off Gigantangan Island, between Masbate and Leyte. Lat. $11^{\circ} 36' 39''$ N.; long. $124^{\circ} 13' 30''$ E. Surface. 7.14 p. m. Surf. temp. 84° . Immense number of specimens.

D. 5422. March 30, 1909. Off Lusaran Point. Lat. $10^{\circ} 31' N.$; long. $122^{\circ} 18' 45'' E.$ Surface. 7.17 p. m. Surf. temp. 82° . Many small specimens.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22''$ N.; long. $124^{\circ} 45' 06'' E.$ 100 fathoms. 9 p. m. 7 specimens.

D. 5539. August 19, 1909. Off Apo Island. Lat. $9^{\circ} 03' 20'' N.$; long. $123^{\circ} 24' 30'' E.$ Surface. 7.11 p. m. Surf. temp. 83° . 4 specimens.

Description.—This species is very similar and closely allied to *E. gibboides* Ortmann, as described and figured by me.¹ In reality I have been unable to find any specific differences between the two species in the shape of the frontal plate, the rostrum, the gastric area, the eyes, the antennular peduncles, etc. Third abdominal segment has the dorsal middle of the hind margin a little or somewhat produced, and this produced part is either frequently rounded, or terminates in a small and extremely slender spiniform process.

The male copulatory organs (figs. 1a-1d) of first pleopods afford some striking characters. The terminal process (p^2) has the foot of moderate length and the heel rather short, thick, straight; the process beyond the foot is moderately long, seen from behind (fig. 1b) straight, moderately stout, not tapering beyond the middle, and with the end obtuse; seen from the inner side (fig. 1c), it is somewhat curved forward at the middle, widening from the middle (fig. 1d) toward the end, which has two conspicuous incisions dividing the terminal part into three teeth; the median tooth is long, somewhat curved, acute; the posterior tooth is smaller but at least twice as

¹ Mem. Mus. Comp. Zool., vol. 35, No. 4, p. 252, pl. 9, figs. 2a-2h.

long as broad; the third tooth is small, triangular, shorter than broad. The proximal process (p^3) is long and nearly regularly curved, thickened near the base on the outer side and the terminal part is very expanded, but this expanded part differs considerably from that in *E. gibboides*; that expansion, seen from the inner side (fig. 1*d*) is vertical on the process (in *E. gibboides* it is very oblique) and its anterior narrow part is narrower and much longer than in *E. gibboides*. The median lobe has no protruding, acute triangle on the proximal part of the inner margin; the distal part is broad seen from behind with the distal margin broadly rounded; seen from the inner side (fig. 1*c*) the lobe has the terminal margin long and a little oblique, while the terminal angle is about 70° ; in *E. gibboides* the lobe has an acute, protruding tubercle on the inner margin, and the distal part is produced into a somewhat oblong triangle with the end acute. The lateral process (p^4) has the major part strongly curved and without any accessory tooth.

Length of a large female, 18 mm.; of a large male, 17.5 mm.

The *type*, a male, is Cat. No. 47890, U.S.N.M.

The *paratype*, a female, is Cat. No. 47889, U.S.N.M.

Remarks.—The differences between the distal parts of the terminal and proximal processes and the median lobe of the copulatory organs in *E. fallax* and those in *E. gibboides* are so strong that the two species are well separated. Besides, *E. fallax* is considerably smaller than *E. gibboides*. The females of the two species are difficult to separate; in *E. gibboides* the process on third abdominal segment is always present and at least in larger specimens stronger and more developed than in *E. fallax*.

Genus PSEUDEUPHAUSIA H. J. Hansen.

Only a single species is known.

17. PSEUDEUPHAUSIA LATIFRONS G. O. Sars.

January 15, 1908. Nasugbu Bay, Luzon. (About lat. $13^\circ 55'$ N.) Anchorage. Surface. 7 p. m. Electric light. 1 specimen.

January 21, 1908. Nasugbu Bay, Luzon. Anchorage. Surface. 7.30 p. m. Large number of specimens.

February 20, 1909. Taal anchorage, Balayan Bay, Luzon. (About lat. $13^\circ 48'$ N., long. $120^\circ 45'$ E.) Surface. 7.30 p. m. 1 specimen.

July 22, 1908. Varadero Bay, anchorage. Lat. $13^\circ 40' 09''$ N.; long. $120^\circ 59' 30''$ E. 6–15 feet. 8 p. m. Immense number of specimens.

July 22, 1908. Varadero Harbor. 10.30–11.30 p. m. Numerous specimens.

July 22, 1908. Varadero Harbor. 11.30–12.30 a. m. 6 specimens.

June 18, 1909. Lagonoy Gulf, Nato Anchorage, east coast of Luzon. (Near lat. $13^{\circ} 37' N.$) Surface. 7.30 p. m. 3 specimens.

March 9, 1909. Ragay Bay, anchorage, Luzon. (About lat. $13\frac{1}{2}^{\circ} N.$) Surface. 7 p. m. Many specimens.

March 5, 1909. Ragay Gulf, Luzon. 3 specimens.

March 9, 1909. Refugio Island, Pasacao Anchorage, Ragay Gulf, Luzon. 12–30 feet. 8 a. m. Electric light. Immense number of specimens.

June 3, 1908. Mansalay Bay, anchorage, Mindoro. (About lat. $12\frac{1}{2}^{\circ} N.$) Surface. 9 p. m. Numerous specimens.

December 20, 1908. Bolalo Bay, Palawan Island. (About lat. $11^{\circ} N.$) Anchorage. Surface. 8.30 p. m. Electric light. Immense number of specimens.

D. 5340. December 22, 1908. Off Cone Island, Melampaya Sound, Palawan Island. Lat. $10^{\circ} 55' 51'' N.$; long. $119^{\circ} 14' 12'' E.$ 17–22 fathoms. 8.22 a. m. Surf. temp. 80° . 44 specimens.

December 23, 1908. Endeavour Strait, anchorage between Bando and Endeavour Points. (About lat. $10^{\circ} 55' N.$) Surface. 8 p. m. Many specimens, larva and young.

December 23, 1908. Endeavour Strait. Surface. 8.30 p. m. Electric light. About 20 specimens, full-grown.

D. 5125. February 3, 1908. Off Nogas Island, Panay, Sulu Sea. Lat. $10^{\circ} 48' N.$; long. $121^{\circ} 48' 30'' E.$ 365 fathoms. 9.41 a. m. Bot. temp. 50° , dens. 1.02475. 2 specimens.

D. 5352. December 30, 1908. Off Tidepole Point, Ulugan Bay, Palawan Island. Lat. $10^{\circ} 04' 30'' N.$; long. $119^{\circ} 05' E.$ 24 fathoms. 6.18 a. m. Surf. temp. 81° . 23 specimens.

D. 5531. August 11, 1909. Off Balicasag Island. Lat. $9^{\circ} 27' 30'' N.$; long. $123^{\circ} 38' E.$ Surface. 7.49 p. m. Surf. temp. 84° . 3 specimens.

August 4, 1909. Opol, Macajalar Bay, Mindanao. (About $8^{\circ} 37' N.$) 5–12 feet. 1 p. m. 3 specimens.

D. 5595. October 6, 1909. Zamboanga, Mindanao. Lat. $6^{\circ} 54' N.$; long. $122^{\circ} 04' 30'' E.$ Ship at anchor. Surface. 7.13 p. m. Surf. temp. 80° . 1 specimen.

D. 5596. October 10, 1909. Zamboanga, Mindanao. Ship at anchor. Surface. 6 p. m. Surf. temp. 81° . 1 specimen.

D. 5553. September 17, 1909. Sulade Island, anchorage. Lat. $5^{\circ} 51' N.$; long. $120^{\circ} 46' 30'' E.$ Surface. 7.28 p. m. Surf. temp. 83° . About 35 specimens.

D. 5568. September 22, 1909. Off Singaan Island, north of Tawi Tawi. Lat. $5^{\circ} 45' 50'' N.$; long. $120^{\circ} 26' E.$ Surface. 6.35 p. m. Surf. temp. 83° . 4 specimens.

February 26, 1908. Tumindao Island, anchorage, Sulu Archipelago. (About lat. $4\frac{2}{3}^{\circ}$ N.) 9–15 feet. 2 specimens.

D. 5588. September 28, 1909. Off Mabul Island, near Borneo. Lat. $4^{\circ} 14' 20''$ N.; long. $118^{\circ} 36' 48''$ E. Ship at anchor. Surface. 6.10 p. m. Surf. temp. 82° . Immense number of specimens.

D. 5600. November 7, 1909. North of Celebes. Lat. $2^{\circ} 05' N.$; long. $123^{\circ} 52' 30'' E.$ Surface. 7.06 p. m. Surf. temp. 82° . About 40 specimens.

November 9, 1909. Talisse Island, north of Celebes. (About lat. $2^{\circ} N.$) 10–18 feet. 6 a. m. About 35 specimens.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36' N.$; long. $126^{\circ} 52' 20'' E.$ 20–30 fathoms. 6.44 p. m. Surf. temp. 84° . 3 specimens.

D. 5633. December 2, 1909. Off Selang Point. Lat. $1^{\circ} 03' S.$; long. $127^{\circ} 44' E.$ Surface. 7.14 p. m. Surf. temp. 84° . About 35 specimens.

Remarks.—The long list of localities shows that this small and very characteristic form is widely distributed in the Philippine Archipelago; it is especially common in shallow water near the coast and occurs sometimes in vast numbers.

Genus NEMATOSCELIS G. O. Sars.

Of this sharply defined genus six species have been established, three of which are represented in the collection, which also includes a new species.

18. NEMATOSCELIS MICROPS G. O. Sars.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 13 specimens.

D. 5120. January 21, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 45' 30'' N.$; long. $120^{\circ} 30' 15'' E.$ 350 fathoms. 3.10 p. m. Bot. temp. 43.7° , dens. 1.02480. 4 specimens.

D. 5287. July 20, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40'' N.$; long. $120^{\circ} 39' E.$ 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 6 specimens.

19. NEMATOSCELIS LOBATA, new species.

Plate 83, figs. 2a–2f.

Type-locality.—D. 5288. July 22, 1908. Off Matacot Point, Luzon. Lat. $13^{\circ} 43' 30'' N.$; long. $121^{\circ} E.$ 115 fathoms. 8.14 a. m. Immense number of specimens.

D. 5248. May 18, 1908. Off Lanang Point, Gulf of Davao. Lat. $7^{\circ} 07' 25'' N.$; long. $125^{\circ} 40' 24'' E.$ 18 fathoms. 10.38 a. m. Surf. temp. 83° , dens. 1.02453. 2 specimens.

Description.—Very similar and closely allied to *N. microps*, but a little more slender. Rostrum in the female (fig. 2a) long, moderately narrow, at the broader base not marked off from the frontal plate; in the male (fig. 2b) the rostrum is acute, triangular, short, about reaching the middle of the transverse thickening between the eye-stalks, a little shorter than broad and scarcely or not marked off from the frontal plate. Carapace in the adult male with a distinct marginal denticle a little from the posterior end, in the adult female without any denticle.

Eyes decidedly smaller than in specimens of *N. microps* of the same size; their upper section is conspicuously smaller than the lower. Antennular peduncles in the female as in *N. microps*, in the male not quite so thick as in this species and its lower flagellum without any curved basal portion. Prehensile legs nearly as in *N. gracilis*.

The male copulatory organs of first pleopods (figs. 2c-2f) show peculiar features. The inner lobe is obliquely rounded, with the result that the spine-shaped process (p^1) originates not only considerably more proximally than the terminal process (p^2), but even more proximally than the proximal process (p^3). The spine-shaped process (p^1) is long, nearly as long as, or longer than, the proximal process (p^3) and from a little less to a little more than twice as long as the terminal process (p^2), which is short, somewhat conical. The proximal process is thick at the base and tapers to the subacute or blunt end; it is frequently curved, sometimes nearly straight. The median lobe (*lm*) is uncommonly large, not twice as long as broad, with the outer margin and the somewhat curved terminal margin forming together a long very arcuate line, while the inner margin is flatly convex and at its end an acute or subacute terminal angle is found; the lateral process (p^4), which is very small, is placed near the base of the lobe just opposite the insertion of the proximal process. The auxiliary lobe is somewhat short; the setiferous lobe is moderately broad, reaches distinctly beyond the median lobe, and has only six setae.

Length of a large female, 14.5 mm.; of an adult male, 12 mm.

The *type*, a male, is Cat. No. 47888, U.S.N.M.

The *paratype* a female, is Cat. No. 47889, U.S.N.M.

Remarks.—*N. lobata* is smaller and more slender than *N. microps*, with somewhat smaller eyes. But the male copulatory organs afford the best characters; the median lobe differs widely in shape and size from that in *N. microps* or *N. atlantica*, the terminal process is considerably shorter than in *N. microps*; the inner and the median lobes and their processes show several other peculiar features mentioned above. All my specimens, several hundred, have a peculiar grayish color, but I do not know whether that may be due to the

preservation or not. *N. lobata* is easily separated from *N. gracilis* by the shape of rostrum in both sexes and by the lower antennular flagellum and the copulatory organs in the male.

20. NEMATOSCELIS GRACILIS H. J. Hansen.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Surf. temp. 80° , bot. temp. 36.2° , dens. 1.02574. 8 specimens.

D. 5120. January 21, 1908. Off Sombbrero Island, near southern Luzon. Lat. $13^{\circ} 45' 30'' N.$; long. $120^{\circ} 30' 15'' E.$ 350 fathoms. 3.10 p. m. Bot. temp. 43.7° , dens. 1.02480. 6 specimens.

D. 5287. July 20, 1908. Off Sombbrero Island, near southern Luzon. Lat. $13^{\circ} 34' 40'' N.$; long. $120^{\circ} 39' E.$ 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 13 specimens.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22'' N.$; long. $124^{\circ} 45' 06'' E.$ 100 fathoms. 9 p. m. Large number of specimens.

D. 5531. August 11, 1909. Off Balicasag Island. Lat. $9^{\circ} 27' 30'' N.$; long. $123^{\circ} 38' E.$ Surface. 7.49 p. m. Surf. temp. 84° . 2 specimens.

D. 5495. August 2, 1909. Off Diuata Point, between Leyte and Mindanao. Lat. $9^{\circ} 06' 30'' N.$; long. $125^{\circ} 00' 20'' E.$ 600 fathoms. Surf. temp. 83° , bot. 52.3° . 2 specimens (male and female).

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45'' N.$; long. $124^{\circ} 36' 45'' E.$ 200 fathoms. 11.25 a. m. Surf. temp. 84° , bot. 53.5° . 11 specimens.

D. 5544. September 6, 1909. Off Coronado Point, northern Mindanao. Lat. $8^{\circ} 16' 30'' N.$; long. $122^{\circ} 26' 30'' E.$ 600 fathoms. 11.17 a. m. Bot. temp. 49.8° . 2 specimens.

21. NEMATOSCELIS TENELLA G. O. Sars.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 4 specimens.

D. 5288. July 22, 1908. Off Matabot Point, Luzon. Lat. $13^{\circ} 43' 30'' N.$; long. $121^{\circ} E.$ 115 fathoms. 8.14 a. m. 4 specimens.

D. 5287. July 20, 1908. Off Sombbrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40'' N.$; long. $120^{\circ} 39' E.$ 310 fathoms. 2.58 p. m. Bot. temp. 43.4° , dens. 1.02521. 12 specimens.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22'' N.$; long. $124^{\circ} 45' 06'' E.$ 100 fathoms. 9 p. m. 1 specimen.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45'' N.$; long. $124^{\circ} 36' 45'' E.$ 200 fathoms. 11.25 a. m. Surf. temp. 84° , bot. 53.5° . 1 specimen.

Genus NEMATOBRACHION Calman.

The collection contains two of the three species hitherto known.

22. NEMATOBRACHION BOOPIS Calman.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 1 specimen, young.

D. 5120. January 21, 1908. Off Sombrero Island, near southern Luzon. Lat. $13^{\circ} 45' 30'' N.$; long. $120^{\circ} 30' 15'' E.$ 350 fathoms. 3.10 p. m. Bot. temp. 43.7° , dens. 1.02480. 1 specimen.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45'' N.$; long. $124^{\circ} 36' 45'' E.$ 200 fathoms. 11.25 a. m. Surf. temp. 84° , bot. 53.5° . 3 specimens, young.

23. NEMATOBRACHION FLEXIPES Ortmann.

D. 5457. June 8, 1909. Off Legaspi Light, east coast of Luzon. Lat. $13^{\circ} 12' N.$; long. $123^{\circ} 49' 40'' E.$ 146 fathoms. 9.40 a. m. 1 specimen.

D. 5422. March 30, 1909. Off Lusaran Point. Lat. $10^{\circ} 31' N.$; long. $122^{\circ} 18' 45'' E.$ Surface. 7.17 p. m. Surf. temp. 82° . 2 specimens.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22'' N.$; long. $124^{\circ} 45' 06'' E.$ 100 fathoms. 9.00 p. m. 12 specimens.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45'' N.$; long. $124^{\circ} 36' 45'' E.$ 200 fathoms. 11.25 a. m. Surf. temp. 84° , bot. 53.5° . 16 specimens.

Genus STYLOCHEIRON G. O. Sars.

The collection contains six of the nine species known.

24. STYLOCHEIRON CARINATUM G. O. Sars.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31' N.$; long. $117^{\circ} 53' E.$ 20 fathoms. 7.23 p. m. Surf. temp. 79° . 2 specimens.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 6 specimens.

June 18, 1909. Lagonoy Gulf, Nato Anchorage, east coast of Luzon. (Near lat. $13^{\circ} 37' N.$). Surface. 7.30 p. m. 1 specimen.

D. 5422. March 30, 1909. Off Lusaran Point. Lat. $10^{\circ} 31' N.$; long. $122^{\circ} 18' 45'' E.$ Surface. 7.17 p. m. Surf. temp. 82° . Immense number of specimens.

D. 5553. September 17, 1909. Sulade Island, anchorage. Lat. $5^{\circ} 51' N.$; long. $120^{\circ} 46' 30'' E.$ Surface. 7.28 p. m. Surf. temp. 83° . 5 specimens.

D. 5611. November 19, 1909. Off Buka Buka Island, Gulf of Tomini, Celebes. Lat. $0^{\circ} 40' 30''$ S.; long. $121^{\circ} 50'$ E. Surface. 7.14 p. m. Surf. temp. 84° . About 50 specimens.

25. STYLOCHEIRON LONGICORNE G. O. Sars.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 10 specimens.

D. 5288. July 22, 1908. Off Matacot Point, Luzon. Lat. $13^{\circ} 43' 30'' N.$; long. $121^{\circ} E.$ 115 fathoms. 8.14 a. m. 3 specimens.

D. 5456. June 7, 1909. Off Lagaspi Point, east coast of Luzon. Lat. $13^{\circ} 11' 10'' N.$; long. $123^{\circ} 51' 52'' E.$ 120 fathoms. 12.55 p. m. 1 specimen.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22'' N.$; long. $124^{\circ} 45' 06'' E.$ 100 fathoms. 9 p. m. 1 specimen.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45'' N.$; long. $124^{\circ} 36' 45'' E.$ 200 fathoms. 11.25 p. m. Surf. temp. 84° , bot. 53.5° . 1 specimen.

26. STYLOCHEIRON AFFINE H. J. Hansen.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31' N.$; long. $171^{\circ} 53' E.$ 20 fathoms. 7.23 p. m. Surf. temp. 79° . 2 specimens.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58' N.$; long. $120^{\circ} 03' E.$ 800 fathoms. 2.25 p. m. Bot. temp. 36.2° , dens. 1.02574. 2 specimens.

D. 5287. July 20, 1908. Off Sombbrero Island, near southern Luzon. Lat. $13^{\circ} 37' 40'' N.$; long. $120^{\circ} 39' E.$ 310 fathoms. 2.58 p. m. Bot. temp. 43.4° ; dens. 1.02521. 4 specimens.

D. 5456. June 7, 1909. Off Lagaspi Point, east coast of Luzon. Lat. $13^{\circ} 11' 10'' N.$; long. $123^{\circ} 51' 52'' E.$ 120 fathoms. 12.55 p. m. About 40 specimens.

D. 5422. March 30, 1909. Off Lusaran Point. Lat. $10^{\circ} 31' N.$; long. $122^{\circ} 18' 45'' E.$ Surface. 7.17 p. m. Surf. temp. 82° . 9 specimens.

D. 5190. April 1, 1908. Off Pescador Island. Lat. $10^{\circ} 08' 15'' N.$; long. $123^{\circ} 16' 45'' E.$ 250 fathoms. 4.39 p. m. Bot. temp. 63° ; dens. 1.02482. 1 specimen.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22'' N.$; long. $124^{\circ} 45' 06'' E.$ 100 fathoms. 9 p. m. 4 specimens.

D. 5495. August 2, 1909. Off Diuata Point, between Leyte and Mindanao. Lat. $9^{\circ} 06' 30'' N.$; long. $125^{\circ} 00' 20'' E.$ 600 fathoms. 1.54 p. m. Bot. temp. 52.3° . 3 specimens.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45'' N.$; long. $124^{\circ} 36' 45'' E.$ 200 fathoms. 11.25 a. m. Surf. temp. 84° ; bot. 53.5° . 8 specimens.

D. 5544. September 6, 1909. Off Coronado Point, northern Mindanao. Lat. $8^{\circ} 16' 30''$ N.; long. $122^{\circ} 26' 30''$ E. 600 fathoms. 11.17 a. m. Bot. temp. 49.8° . 5 specimens.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36'$ N.; long. $126^{\circ} 52' 20''$ E. 20–30 fathoms. 6.44 p. m. Surf. temp. 84° . 1 specimen.

27. *STYLOCHEIRON MICROPHTHALMA* H. J. Hansen.

D. 5319. November 5, 1908. China Sea. Lat. $21^{\circ} 31'$ N.; long. $117^{\circ} 53'$ E. 20 fathoms. 7.23 p. m. Surf. temp. 79° . 2 specimens.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58'$ N.; long. $120^{\circ} 03'$ E. 180 fathoms. 4 p. m. Bot. temp. 36.2° ; dens. 1.02574. 3 specimens.

August 3, 1909. Mahinog, Camiguin Island, between Leyte and Mindanao. (About lat. $9^{\circ} 07'$ N.) 12–20 feet. 6.30 a. m. 1 specimen.

D. 5616. November 22, 1909. Off Tifore Island, Molucca Passage. Lat. $0^{\circ} 36'$ N.; long. $126^{\circ} 52' 20''$ E. 20–30 feet. 6.44 p. m. Surf. temp. 84° . 4 specimens.

28. *STYLOCHEIRON ABBREVIATUM* G. O. Sars.

D. 5320. November 6, 1908. China Sea. Lat. $20^{\circ} 58'$ N.; long. $120^{\circ} 03'$ E. 1804 fathoms. 2.25 p. m. Bot. temp. 36.2° ; dens. 1.02574. 7 specimens.

D. 5288. July 22, 1908. Off Matacot Point, Luzon. Lat. $13^{\circ} 43' 30''$ N.; long. 121° E. 115 fathoms. 8.14 a. m. 1 specimen.

D. 5457. June 8, 1909. Off Legaspi Island, east coast of Luzon. Lat. $13^{\circ} 12'$ N.; long. $123^{\circ} 49' 40''$ E. 146 fathoms. 9.40 a. m. 2 specimens.

D. 5422. March 30, 1909. Off Lusan Point. Lat. $10^{\circ} 31'$ N.; long. $122^{\circ} 18' 45''$ E. Surface. 7.17 p. m. Surf. temp. 82° . 7 specimens.

D. 5233. May 7, 1908. Off Limasaua Island. Lat. $10^{\circ} 00' 22''$ N.; long. $124^{\circ} 45' 06''$ E. 100 fathoms. 9 p. m. 9 specimens.

D. 5500. August 4, 1909. Off Macabalan Point, Mindanao. Lat. $8^{\circ} 37' 45''$ N.; long. $124^{\circ} 36' 45''$ E. 200 fathoms. 11.25 a. m. Surf. temp. 84° ; bot., 53.5° . 6 specimens.

29. *STYLOCHEIRON MAXIMUM* H. J. Hansen.

D. 5288. July 22, 1908. Off Matacot Point, Luzon. Lat. $13^{\circ} 43' 30''$ N.; long. 121° E. 115 fathoms. 8.14 a. m. 2 specimens.

D. 5500. August 4, 1908. Off Macabalan Point., Mindanao. Lat. $8^{\circ} 37' 45''$ N.; long. $124^{\circ} 36' 45''$ E. 200 fathoms. 11.25 a. m. Surf. temp. 84° ; bot. 53.5° . Many specimens.

EXPLANATION OF PLATE 83.

Euphausia fallax.

- Fig. 1a. Male copulatory organ of first left pleopod, unrolled and seen from behind; $\times 42$.
- 1b. Inner and median lobes of the organ shown in fig. 1a, from behind; $\times 64$. p^2 , terminal process; p^3 , proximal process; p^4 , lateral process.
- 1c. Inner and median lobes of the same organ, from the inner side; $\times 64$. The lettering as in fig. 1b.
- 1d. Distal part of the terminal (p^2) and the proximal process (p^3) of the same organ, from the inner side; $\times 100$.

Nematoscelis lobata.

- Fig. 2a. Anterior part of carapace, eyes, and the proximal half of the antennular peduncles of an adult female, from above; $\times 13$.
- 2b. Anterior part of carapace, eyes, and the proximal half of the antennular peduncles of an adult male, from above; $\times 13$.
- 2c. Male copulatory organ of first left pleopod, unrolled and seen from behind; $\times 64$. *lm*, median lobe.
- 2d. Inner lobe and proximal inner part of the median lobe of the organ shown in fig. 2c, from behind; $\times 105$. p^1 , spine-shaped process; p^2 , terminal process; p^3 , proximal process; p^4 , lateral process.
- 2e. Inner lobe of another organ; $\times 105$.
- 2f. Inner and median (*lm*) lobe of a third organ, from in front; $\times 105$.